Of the highs three appeared off the Pacific coast, two to the rivers are shown on Chart V. north of Montana, and three in Manitoba or the Lake Superior region. Five of these were traced to the south Atlantic burg, on the Mississippi; Cincinnati, on the Ohio; Nashville, coast, two to Newfoundland, and one disappeared in Illinois.

Lows.—Of the lows, five were first seen near Montana, three in the central Plateau region, and two in the lower Missouri Valley. Six of the storms could be followed to Newfoundland, two were last noticed off the middle Atlantic coast, and one died out in the central Gulf States. As low No. I moved into the Atlantic Ocean a northeast wind of 52 miles an hour occurred at Block Island, p.m. of 4th. As low No. VIII reached the upper Lake region, evening of the 25th, a west wind of 48 miles an hour was caused at Cleveland. The same afternoon Parkersburg experienced a thunderstorm with west wind of 52 miles, and Pittsburg the same kind of wind of 48 miles from the northwest.—H. A. Hazen, Professor.

Movements of centers of areas of high and low pressure.

	First o	bserv	ed.	Last o	bserv	ed.	Pat	h.	Average velocities.		
Number.	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.	
High areas.  I	*28, a. m. 1, p. m. 1, p. m. 5, a, m. 12, p. m. 17, a. m. 20, a. m. 23, a. m.	0 87 52 87 50 52 50 49 42	0 124 96 123 84 115 107 93 127	1, p.m. 3, p.m. 11, a.m. 9, a.m. 19, p.m. 20, a.m. 25, p.m. 30, p.m.	0 32 49 82 84 48 39 27 33	0 78 69 78 76 54 88 79	Miles. 3, 240 1, 740 5, 490 1, 500 3, 780 1, 500 2, 370 4, 200	Days. 4.5 2.0 9.5 4.0 7.0 3.0 5.5 7.5	Miles, 720 870 578 375 546 500 431 560	Miles. 30.0 36.2 24.1 15.6 22.5 20.8 18.0 23.3	
Total Mean of 8 paths Mean of 49 days					•••••		23, 820 2, 977	43.0	4, 574 572 554	23.8 23.1	
III III IV V VI VII VIII IX X Total Mean of 10 paths Mean of 44.5						69 88 55 78 55 56 55 69 58	2,520 2,550 2,550 1,470 3,060 3,450 2,640 1,830 2,550 2,640 25,440 2,544	5.0 4.0 3.5 3.5 5.5 6.5 4.5 2.5 4.5 5.0 44.5	504 637 780 420 556 581 587 732 567 528 5, 842 584	21.0 26.5 32.5 17.5 23.2 22.1 24.5 23.6 23.6 22.0	
days	* M			• • • • • • • • • • • • • • • • • • • •			July.		572	23.8	

## RIVERS AND FLOODS.

During June the general tendency of all streams, except the extreme upper Mississippi and central Missouri, was to lower levels, and at intervals navigation on the rivers of South Carolina, Georgia, and Alabama, and on the Ohio and Cumberland rivers was seriously interrupted. Good navigable stages, however, were maintained on the Mississippi, | F Missouri, Arkansas, and Red rivers.

Heavy and in some instances excessive precipitation from the 2d to the 4th over the watersheds of the extreme upper Mississippi and the St. Croix rivers caused a rapid and decided rise of the rivers in that vicinity, and some apprehension was felt by squatters in the lowlands. There is no steamboating in that section; there is, however, considerable logging carried on, and the latter interest is reported as having sustained considerable damage. Sawmills were shut down and bottoms overflowed, the latter resulting in slight damage is to crops. A moderate flood also occurred in the Kansas City | F river district, but no material damage was done.

The highest and lowest water, mean stage, and monthly range at 118 river stations are given in the accompanying | z

diminishing the effect of the diurnal change in temperature. table. Hydrographs for typical points on seven principal The stations selected for charting are: Keokuk, St. Louis, Cairo, Memphis, and Vickson the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

> For fuller details see Monthly Bulletin of the River and Flood Service for June, 1898.—F. W. Krichelt.

> > Heights of rivers referred to zeros of gauges, June, 1898.

Stations	Heights of r			rd to zero	os of gar	uges, Ju	ine, 1898			
Mississippi River   Miles   Feet   Feet   St. Paul, Minn   1,957   14   10.7   8,0   4.7   30   7.3   6.4   4.8	Stations.	ance to outh of er.	ger line gauge.	Highes	t water.	Lowes	t water.	ı stage	onthl range.	
St. Paul, Minn   1,957   14   10.7   8,9   4.7   30   7.3   6.0		Dista mo riv	Dang on g	Height.	Date.	Пeight.	Date.	Меал		
Reeds Landing Minn	Mississippi River.	Miles.			0.0			Feet.		
La Crosse, Wis.   1,822   10   9,9   15   5,0   1   7,6   4,9     Dabugue, Iowa   1,702   18   10,0   19,2   2,4   1   1   6,5   4,9     Dabugue, Iowa   1,702   18   10,0   19,2   2,4   1   1   6,5   4,9     Dabugue, Iowa   1,702   18   10,0   19,2   2,4   1   1   6,5   4,9     Dabugue, Iowa   1,702   18   10,0   19,2   2,4   1   1   6,5   4,6     Galland, Iowa   1,703   8   4,4   27   2,2   8   8,2   2,2     Galland, Iowa   1,475   8   4,4   27   2,2   2,3   8   8,2   2,2     Hannibal, Mo   1,405   17   9,3   2,3   3   9,5   6   4,6     Hannibal, Mo   1,405   17   9,3   3   2,4   4,9   8   7,0     Hannibal, Mo   1,405   17   9,3   3   2,4   4,9   8   7,0     Hannibal, Mo   1,204   30   25,4   8   18,7   9,2   11,3   5,7     Chester, Ill   1,189   30   20,0   18,19   14,7   9,20   13,3   5,7     Chester, Ill   1,193   30   20,0   18,19   14,7   9,20   13,8   5,7     Memphis, Tenn   843   33   24,9   1   15,6   15,29   18,7   9,3     Helema, Ark   565   40   36,8   1   32,2   230   38,0   12,8     Greenville, Miss   565   40   36,8   1   32,2   30   38,0   12,8     Greenville, Miss   565   40   36,8   1   32,2   30   38,0   12,8     Greenville, Miss   545   40   44,0   1   2,2,5   30   32,3   11,2     Fort Nmith, Ark   345   22   13,8   16   6,7   3   9,3   71,1     Fort Smith, Ark   345   22   13,8   16   6,7   3   9,3   71,1     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   23   15,3   19   9,8   6   11,6   6,5     Fort Smith, Ark   170   170   170   18   19,5     Fort Smith, Ark   170   170   170   18   19,5	Reeds Landing, Minn	1,887			8,9			6.4	4.8	
Dubuque, lowa	La Crosse, Wis	1,822	10	9.9	15	5.0	1	7.6	4.9	
St. Louis, Mo. 1,284 30 25.4 18 18.7 28 21 30 2.7 Chester, III 1, 189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30.9 1 1 21.8 20 25.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 11.8 Helena, Ark 767 44 36.0 1 23.2 30 28.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 31.1 15.6 15.29 18.7 9.3 31.1 15.0 15.0 15.0 15.8 11.2 26.6 30 28.0 12.8 Arkansas City, Ark 635 44 42.8 1 27.1 20.0 28.3 12.9 4.7 Wickita, Kans. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.3 10.2 23 12.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 3.1 21.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 7.1 Dardanelle, Ark 250 21 14.0 18 7.5 4 10.0 6.5 Elitle Rock, Ark. 170 23 15.3 19 9.8 6 11.6 5.5 William River. 150 25 14.5 1 6.1 28.29 7.9 8.4 Des Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 32 4 13.5 1 8.8 26 10.8 4.7 Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 12 28 8.2 1 1 9.4 3.0 Slow. City, Iowa 676 19 14.7 30 12.1 19.20 13.2 2.6 Omaha, Nehr 561 18 14.0 10.1 17.7 13.4 25 15.0 19 1.2 2.0 10.2 10.2 10.2 10.2 10.2 10.2 1	Dubuque, Iowa	1,702		9.4	21-23				4.9	
St. Louis, Mo. 1,284 30 25.4 18 18.7 28 21 30 2.7 Chester, III 1, 189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30.9 1 1 21.8 20 25.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 11.8 Helena, Ark 767 44 36.0 1 23.2 30 28.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 31.1 15.6 15.29 18.7 9.3 31.1 15.0 15.0 15.0 15.8 11.2 26.6 30 28.0 12.8 Arkansas City, Ark 635 44 42.8 1 27.1 20.0 28.3 12.9 4.7 Wickita, Kans. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.3 10.2 23 12.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 3.1 21.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 7.1 Dardanelle, Ark 250 21 14.0 18 7.5 4 10.0 6.5 Elitle Rock, Ark. 170 23 15.3 19 9.8 6 11.6 5.5 William River. 150 25 14.5 1 6.1 28.29 7.9 8.4 Des Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 32 4 13.5 1 8.8 26 10.8 4.7 Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 12 28 8.2 1 1 9.4 3.0 Slow. City, Iowa 676 19 14.7 30 12.1 19.20 13.2 2.6 Omaha, Nehr 561 18 14.0 10.1 17.7 13.4 25 15.0 19 1.2 2.0 10.2 10.2 10.2 10.2 10.2 10.2 1	Leclaire, Iowa	1,612							2.9	
St. Louis, Mo. 1,284 30 25.4 18 18.7 28 21 30 2.7 Chester, III 1, 189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30.9 1 1 21.8 20 25.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 11.8 Helena, Ark 767 44 36.0 1 23.2 30 28.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 31.1 15.6 15.29 18.7 9.3 31.1 15.0 15.0 15.0 15.8 11.2 26.6 30 28.0 12.8 Arkansas City, Ark 635 44 42.8 1 27.1 20.0 28.3 12.9 4.7 Wickita, Kans. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.3 10.2 23 12.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 3.1 21.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 7.1 Dardanelle, Ark 250 21 14.0 18 7.5 4 10.0 6.5 Elitle Rock, Ark. 170 23 15.3 19 9.8 6 11.6 5.5 William River. 150 25 14.5 1 6.1 28.29 7.9 8.4 Des Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 32 4 13.5 1 8.8 26 10.8 4.7 Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 12 28 8.2 1 1 9.4 3.0 Slow. City, Iowa 676 19 14.7 30 12.1 19.20 13.2 2.6 Omaha, Nehr 561 18 14.0 10.1 17.7 13.4 25 15.0 19 1.2 2.0 10.2 10.2 10.2 10.2 10.2 10.2 1	Galland, Iowa	1,475	8	4.4	27	2.2	8	3.2	2.2	
St. Louis, Mo. 1,284 30 25.4 18 18.7 28 21 30 2.7 Chester, III 1, 189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,189 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30 20.0 18,19 141.7 28 16.8 5.3 Cairo, III 1,173 40 30.9 1 1 21.8 20 25.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 11.8 Helena, Ark 767 44 36.0 1 23.2 30 28.0 9.1 Memphis, Tenn 843 33 24.9 1 15.6 15.29 18.7 9.3 31.1 15.6 15.29 18.7 9.3 31.1 15.0 15.0 15.0 15.8 11.2 26.6 30 28.0 12.8 Arkansas City, Ark 635 44 42.8 1 27.1 20.0 28.3 12.9 4.7 Wickita, Kans. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.8 30 28.3 14.2 Vicksburg, Mish. 476 44 42.0 1 2.3 27.3 10.2 23 12.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 3.1 21.9 4.7 Wichita, Kans. 729 10 5.6 10 2.3 7.3 9.3 7.1 Dardanelle, Ark 250 21 14.0 18 7.5 4 10.0 6.5 Elitle Rock, Ark. 170 23 15.3 19 9.8 6 11.6 5.5 William River. 150 25 14.5 1 6.1 28.29 7.9 8.4 Des Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 32 4 13.5 1 8.8 26 10.8 4.7 Milliam River. 150 19 8.6 11 3.7 30 4.7 4.9 Peoria, III 1 12 28 8.2 1 1 9.4 3.0 Slow. City, Iowa 676 19 14.7 30 12.1 19.20 13.2 2.6 Omaha, Nehr 561 18 14.0 10.1 17.7 13.4 25 15.0 19 1.2 2.0 10.2 10.2 10.2 10.2 10.2 10.2 1	Hannibal, Mo	1,466			27 28			5.6 7.0		
Vicksburg, Miss         74         41         42.0         1.3         37.8         30         8.2         14.2           New Orleans, La         108         16         14.9         2.3         10.2         23         12.9         4.7           Wichita, Kans         790         10         5.6         10         2.3         10.2         23         12.9         4.7           Fort Smith, Ark         345         32         11.8         16         6.7         3         9.3         7.1           Dardanelle, Ark         250         21         14.0         18         7.5         4         10.0         6.5           White Ricer.         150         25         14.5         1         6.1         2.8         2.9         7.9         8.4           Des Moines, Iowa         150         19         8.6         11         3.7         30         4.7         4.9           Peer III.         18         1.8         1.8         8.6         10.0         4.7         4.9           Bismarck, N. Dak         1.006         14         11.2         28         8.2         1         9.4         3.0           Stoux Loseph, Mo         373	Grafton, Ill	1,307	23	13.8	18	10.3	9,10	11.6	3.5	
Vicksburg, Miss         74         41         42.0         1.3         37.8         30         8.2         14.2           New Orleans, La         108         16         14.9         2.3         10.2         23         12.9         4.7           Wichita, Kans         790         10         5.6         10         2.3         10.2         23         12.9         4.7           Fort Smith, Ark         345         32         11.8         16         6.7         3         9.3         7.1           Dardanelle, Ark         250         21         14.0         18         7.5         4         10.0         6.5           White Ricer.         150         25         14.5         1         6.1         2.8         2.9         7.9         8.4           Des Moines, Iowa         150         19         8.6         11         3.7         30         4.7         4.9           Peer III.         18         1.8         1.8         8.6         10.0         4.7         4.9           Bismarck, N. Dak         1.006         14         11.2         28         8.2         1         9.4         3.0           Stoux Loseph, Mo         373	Chester, Ill	1, 189	30	20.0		14.7	26	16.8	5.3	
Vicksburg, Miss         74         41         42.0         1.3         37.8         30         8.2         14.2           New Orleans, La         108         16         14.9         2.3         10.2         23         12.9         4.7           Wichita, Kans         790         10         5.6         10         2.3         10.2         23         12.9         4.7           Fort Smith, Ark         345         32         11.8         16         6.7         3         9.3         7.1           Dardanelle, Ark         250         21         14.0         18         7.5         4         10.0         6.5           White Ricer.         150         25         14.5         1         6.1         2.8         2.9         7.9         8.4           Des Moines, Iowa         150         19         8.6         11         3.7         30         4.7         4.9           Peer III.         18         1.8         1.8         8.6         10.0         4.7         4.9           Bismarck, N. Dak         1.006         14         11.2         28         8.2         1         9.4         3.0           Stoux Loseph, Mo         373	Cairo, III	1,073						25.0 18.7	9.1	
Vicksburg, Miss         74         41         42.0         1.3         37.8         30         8.2         14.2           New Orleans, La         108         16         14.9         2.3         10.2         23         12.9         4.7           Wichita, Kans         790         10         5.6         10         2.3         10.2         23         12.9         4.7           Fort Smith, Ark         345         32         11.8         16         6.7         3         9.3         7.1           Dardanelle, Ark         250         21         14.0         18         7.5         4         10.0         6.5           White Ricer.         150         25         14.5         1         6.1         2.8         2.9         7.9         8.4           Des Moines, Iowa         150         19         8.6         11         3.7         30         4.7         4.9           Peer III.         18         1.8         1.8         8.6         10.0         4.7         4.9           Bismarck, N. Dak         1.006         14         11.2         28         8.2         1         9.4         3.0           Stoux Loseph, Mo         373	Helena, Ark	767	44	36.0	1	23. 2	30	28.0	12.8	
Vicksburg, Miss.	Officiality, miss	00.5		36.8		22.6	30		15.7 14.2	
### Arkansas River. Wichita, Kans.   720   10   5.66   10   2.3   7   3.9   3.3   Fort Smith, Ark   345   22   13.8   16   6.7   3   9.3   7.1   Dardanelle, Ark   250   21   14.0   18   7.5   4   10.0   Withita River.   150   23   15.3   19   9.8   6   11.6   5.5   With River.   150   25   14.5   1   6.1   28.29   7.9   8.4   Dos Moines, Iowa.   150   19   8.6   11   3.7   30   4.7   4.9   Willing River.   135   14   13.5   1   8.8   26   10.8   Willing River.   135   14   13.5   1   8.8   26   10.8   Willing River.   135   14   13.5   1   8.8   Willing River.   135   14   12.5   26   9.0   14,15   10.5   10.5   Willing River.   135   14   13.5   1   8.8   26   10.8   Willing River.   135   14   13.5   1   8.8   25   10.8   Willing River.   135   14   13.5   1   8.8   25   10.8   Willing River.   135   14   13.5   1   8.8   25   10.8   Willing River.   135   14   13.5   1   8.8   2.5   10.8   Willing River.   135   14   13.5   1   8.8   2.5   10.8   Willing River.   135   14   13.5   1   1   1.5   1   1.5   Willing River.   135   14   13.5   1   1   1.5   Willing River.   135   14   13.5   1   1   1.5   Willing River.   136   14   12.2   28   8.2   1   1.5   1.0   Willing River.   14   12.2   28   8.2   1   1.5   1.0   Willing River.   15   15   15   15   1.5   1.5   1.5   Willing River.   15   15   15   1.5   1.5   1.5   1.5   Willing River.   15   15   15   15   1.5   1.5   Willing River.   15   15   15   15   15   15   Willing River.   15   15   15   15   15   15   Willing River.   17   17   18   15   15   15   Willing River.   17   17   18   18   15   15   15   15   15   Willing River.   17   18   18   15   15   15   15   15   Willing River.   17   18   15   15   15   15   15   Willing River.   17   18   15   15   15   15   15   Willing River.   17   18   15   15   15   15   15   Willing River.   17   17   18   15   15   15   15   Willing River.   17   17   18   15   15   15   15   15   Willing River.   17   18   18   18   18   18   18   19   West Newton, Pa.   15   15   15   15   15   15   15   Willing Riv	Vicksburg, Miss New Orleans, La						30 23		14.2	
Fort Smith, Ark	Arkansas River.			٠.		ĺ				
Dardanelle, Ark	Fort Smith, Ark	345	22	13.8			3	9.3	3.3	
White River   Newport Ark   150   26   14.5   1   6.1   28.29   7.9   8.4	Dardanelle, Ark			14.0	18	7.5	4	10,0	6.5	
Des Moines River   Des Moines (low   150   19   8.6   11   3.7   30   4.7   4.9	White River.	1				!			ł	
Illinois River.   Peoria, III   135	Des Moines River.					ļ.				
Missouri River.   Bismarck N. Dak   1, 201   14   12.6   26   9.0   14, 15   10.5   3.6   Nicroticy, Iowa   676   19   14.7   30   12.1   19.20   13.2   2.6   Omaha, Nebr   551   18   14.0   30   11.1   19.20, 21   12.8   2.5   Kansas City, Mo   220   21   21.5   12   16.6   24.25   18.7   4.9   4.5   Nicrotic River.   20.0   19.3   15   14.6   25   15.9   5.4   2.5   16.6   24.25   18.7   4.9   2.0   2.1   21.5   2.1   2.6   2.4   2.5   16.6   24.25   18.7   4.9   2.0   2.1   21.5   2.1   2.6   2.4   2.5   2	Illinois River.									
Pierre, S. Dak.   1,006	Missouri River.					ì		1		
Sloux City, 10wa	Pierre, S. Dak	1,006	14	11.2	28	8.2	1			
St. Joseph, Mo. 280 21 21.5 12 16.6 24.5 18.7 4.9 Boonville, Mo 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.6 25 16.6 5.7 Hermann, Mo. 1991 20 19.3 15 13.4 25 15.9 5.4 Davis Island Dam, Pa 960 25 6.7 15 3.2 12.29 4.5 3.5 Wheeling, W. Va 785 35 9.5 21 5.2 10 7.1 4.3 Point Pleasant, W. Va 783 36 9.3 1 3.4 12 5.9 6.5 Parkersburg, W. Va 785 35 9.5 52 15.2 10 7.1 4.3 Point Pleasant, W. Va 703 36 9.3 1 3.4 12 5.9 5.9 September 1.5 Portsmouth, Ohio 612 50 14.5 1 6.0 14 9.4 8.5 Portsmouth, Ohio 612 50 14.5 1 6.0 14 9.4 8.5 Portsmouth, Ohio 612 50 14.5 1 6.0 14 9.4 8.5 Portsmouth, Ohio 612 50 14.5 1 6.0 14 9.4 8.5 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.7 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.7 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 47 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 48 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 48 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 48 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 49 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 70.2 Paducah, Ky 40 19.8 1 8.6 1 16.4 18 10.1 8.2 Paducah, Ky 40 19.8 1 8.6 1 10.0 10.1 8.1 20.2 Paducah, Ky 40 19.8 1 8.6 1 10.0 10.1 8.1 20.0 Paducah, Ky 40 19.8 1 10.0 10.1 8.1 20.0 Paducah, Ky 40 19.8 1 10.0 10.1 10.1 10.1 10.1 10.1 10.1	Sioux City, Iowa Omaha, Nebr								2.6	
	St. Joseph, Mo	373	10	10.1	10, 11	7.6	1	8.8	2.5	
	Boonville, Mo		20			13.6	24, 25			
Pittsburg, Pa	Hermann, Mo	95	24				25		5.4	
Wheeling, W. Va.   755   36   9.9   20   3.4   12   5.6   6.5   7   75   35   9.5	Pittsburg, Pa					2.9			4.0	
Cattersburg, KY	Wheeling, W. Va	875	36	9.9	20	3.4	12, 29		6.5	
Cattersburg, KY	Parkersburg, W. Va Point Pleasant, W. Va		35 36				10	7.1	4.3	
Cincinnati, Ohlo	Cattetisourg, Ky	651	50	13.0	1	4.4	13	8.2	8.6	
Louisville, Ky	Cincinnati, Ohio	499	45	18.8			14 15, 16		8.5	
Paducah, Ky   47   40   19.8   1   8.6   14   12.2   11.2     Allegheny Ricer.   Warren, Pa   177   7   5.0   28   0.9   17-20,     Oil City, Pa   123   13   3.8   30   1.2   9-12   1.8   2.6     Parkers Landing, Pa   73   20   4.5   29   1.0   8.9, 12   1.8   3.5     Freeport, Pa   26   20   6.4   20   2.1   11, 23   3.4   4.3     Conemangh River   26   20   6.4   20   2.1   11, 23   3.4   4.3     Conemangh River   35   8   2.1   14   0.1   8-12   0.9   2.0     Bacter River   21   14   0.1   8-12   0.9   2.0     Bacter River   21   14   0.1   8-12   0.9   2.0     Burnside, Ky   434   50   3.8   19   0.7   14   2.0   3.1     Carthage, Tenn   257   30   3.4   1, 22   1.5   14   2.3   1.9     Nashville, Tenn   175   40   7.5   1   2.1   15   3.5   5.4     Great Kanawha River   30   25   4.5   29   1.0   18   1.9   3.5     Mainti River   21   21   21   21   21   21   21     Falmouth, Ky   30   25   4.5   29   1.0   18   1.9   3.5     Miami River   21   21   21   21   21   21   21     Daylon, Ohio   69   18   2.4   14   1.2   30   1.7   1.2     Monongahela River   30   25   4.5   29   1.0   3   9.10   0.5   2.5     Greensboro, Pa   81   18   1.5   17   -0.6   24-26   -0.4   2.1     Fairmont, W   Va   161   18   1.5   17   -0.6   24-26   -0.4   2.1     Greensboro, Pa   81   18   8.1   21   6.5   28   7.2   1.6     Cheat River   36   14   3.5   21   1.8   8-13   2.2   1.7     Condition   22   23   24   24   25   23   24   25   25   25     Greensboro, Pa   81   8   8.1   21   6.5   28   7.2   1.6     Cheat River   7   7   7   7   7   7   7   7   7	Louisville, Ky Evansville Ind		24				17	6.3	4.0	
Warren, Pa	Paducah, Ky						14			
Oil City, Pa         123         13         3.8         30         1.2         (20,21)         1.8         2.6           Parkers Landing, Pa         73         20         4.5         29         1.0         8,9,12         1.8         3.5           Freeport, Pa         26         20         6.4         20         2.1         11,29         3.4         4.3           Conemangh River.         30 mstown, Pa         64         7         2.2         14         1.4         7-9         1.7         0.8           Brookville, Pa         35         8         2.1         14         0.1         8-12         0.9         2.0           Bearer River         10         14         5.0         19         -0.3         10-12         0.7         5.8           Ellwood Junction, Pa         10         14         5.0         19         -0.3         10-12         0.7         5.8           Ellwood Junction, Pa         10         14         5.0         19         -0.3         10-12         0.7         5.8           Ellwood Junction, Pa         10         14         5.0         19         -0.3         10-12         0.7         5.8           Carthage	Allegheny River, Warren, Pa	177	7	5.0	28	0.9	5 17-20, }	1.4	4.1	
Freeport. Pa	Oil City, Pa					1.2	9-12		ì	
Conemangh River. Johnstown, Pa	Parkers Landing, Pa Freeport, Pa					1.0				
Red Bank Creek.         35         8         2.1         14         0.1         8-12         0.9         2.0           Beaver River.         Beaver River.         10         14         5.0         19         -0.3         10-12         0.7         5.3           Cumberland River.         Burnside, Ky         434         50         3.8         19         0.7         14         2.0         3.1           Carthage, Tenn         257         30         3.4         1,22         1.5         14         2.3         1.9           Nashville, Tenn         175         40         7.5         1         2.1         15         3.5         5.4           Great Kanawha River.         61         30         7.6         20         4.4         2         6.5         3.2           Hinton, W. Va.         95         14         3.4         19,20         1.3         9-14,29,30         1.8         2.1           Licking River.         Falmouth, Ky         30         25         4.5         29         1.0         18         1.9         3.5           Miami River.         69         18         2.4         14         1.2         30         1.7         1.2	Conemaugh River.					ļ	·		١	
Beaver River.         Beaver River.         10         14         5.0         19         -0.3         10-12         0.7         5.3           Cumberland River.         434         50         3.8         19         0.7         14         2.0         3.1           Carthage, Tenn         257         30         3.4         1,22         1.5         14         2.3         1.9           Nashville, Tenn         175         40         7.5         1         2.1         15         3.5         5.4           Great Kanawha River.         61         30         7.6         20         4.4         2         6.5         3.2           New River.         95         14         3.4         19,20         1.3         9-14,29,30         1.8         2.1           Licking River.         1         30         25         4.5         29         1.0         18         1.9         3.5           Hinton, W. Va.         30         25         4.5         29         1.0         18         1.9         3.5           Halmouth, Ky.         30         25         4.5         29         1.0         18         1.9         3.5           Bayton, Ohio <td>Red Bank Creek.</td> <td></td> <td></td> <td>i I</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Red Bank Creek.			i I						
Cumberland River         434         50         3.8         19         0.7         14         2.0         3.1           Carthage, Tenn         257         30         3.4         1,22         1.5         14         2.3         1.9           Nashville, Tenn         175         40         7.5         1         2.1         15         3.5         5.4           Great Kanawha River         61         30         7.6         20         4.4         2         6.5         3.2           New River         8         19,20         1.3         9-14,29,30         1.8         2.1           Licking River         1         30         25         4.5         29         1.0         18         1.9         3.5           Mammi River         1         30         25         4.5         29         1.0         18         1.9         3.5           Monongahela River         1         2.4         14         1.2         30         1.7         1.2           Monongahela River         2         1.5         17         -0.6         24-26         -0.4         2.1           Fairmont, W. Va         119         25         2.2         14	Beaver River.									
Carthage, Tenn       257       30       3.4       1,22       1,5       14       2.3       1,9         Mashville, Tenn       175       40       7.5       1       2.1       15       3.5       5.4         Great Kanawha River.       61       30       7.6       20       4.4       2       6.5       3.2         Wew River.       95       14       3.4       19,20       1.3       9-14,29,30       1.8       2.1         Licking River.       30       25       4.5       29       1.0       18       1.9       3.5         Miumi River.       30       25       4.5       29       1.0       18       1.9       3.5         Monongahela River.       40       2.4       14       1.2       30       1.7       1.2         Monongahela River.       181       1.8       1.5       17       -0.6       24-26       -0.4       2.1         Fairmont, W. Va       119       25       2.2       14       -0.3       9,10       0.5       2.5         Greensboro, Pa       81       18       8.1       21       6.5       28       7.2       1.6         Lock No. 4, Pa <td< td=""><td>Cumberland River.</td><td> </td><td></td><td> </td><td></td><td>}</td><td>10-12</td><td>0.7</td><td>5.8</td></td<>	Cumberland River.					}	10-12	0.7	5.8	
Nashville, Tenn       175       40       7.5       1       2.1       15       3.5       5.4         Great Kanaucha River.       61       30       7.6       20       4.4       2       6.5       3.2         Hinton, W. Va.       95       14       3.4       19.20       1.3       9-14,29.30       1.8       2.1         Licking River.       1       30       25       4.5       29       1.0       18       1.9       3.5         Himouth, Ky.       30       25       4.5       29       1.0       18       1.9       3.5         Manongahela River.       69       18       2.4       14       1.2       30       1.7       1.2         Monongahela River.       161       18       1.5       17       -0.6       24-26       -0.4       2.1         Fairmont, W. Va.       119       25       2.2       14       -0.3       9,10       0.5       2.5         Greensboro, Pa.       81       18       8.1       21       6.5       28       7.2       1.6         Lock No. 4, Pa.       40       28       7.9       15       5.9       10,11       6.6       2.0 <t< td=""><td>Burnside, Ky Carthage, Tenn</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.1</td></t<>	Burnside, Ky Carthage, Tenn								3.1	
Charleston, W. Va. 61 30 7.6 20 4.4 2 6.5 3.2 New River.  Hinton, W. Va. 95 14 3.4 19.20 1.3 9-14,29,30 1.8 2.1 Licking River.  Falmouth, Ky. 30 25 4.5 29 1.0 18 1.9 3.5 Miamia River.  Dayton, Ohio 69 18 2.4 14 1.2 30 1.7 1.2 Monongahela River.  West New Va. 161 18 1.5 17 - 0.6 24-26 -0.4 2.1 Fairmont, W. Va. 119 25 2.2 14 -0.3 9,10 0.5 2.5 Greensboro, Pa. 81 18 8.1 21 6.5 28 7.2 1.6 Lock No. 4, Pa. 40 28 7.9 15 5.9 10,11 6.6 2.0 Cheat River.  Rowlesburg, W. Va. 36 14 3.5 21 1.8 8-13 2.2 1.7 Youghtogheny River.  Confluence, Pa. 59 10 8.9 14 1.0 10,11 1.8 2.9 Maskingung River.  Muskingung River.	Nashville, Tenn			7.5						
Hinton, W. Va	Charleston, W. Va	61	30	7.6	20	4.4	2	6.5	3.2	
Matumis River.         69         18         2.4         14         1.2         30         1.7         1.2           Monongadela River.         161         18         1.5         17         -0.6         24-26         -0.4         2.1           Fairmont, W. Va         119         25         2.2         14         -0.3         9,10         0.5         2.5           Greensboro, Pa         81         18         8.1         21         6.5         28         7.2         1.6           Lock No. 4, Pa         40         28         7.9         15         5.9         10,11         6.6         2.0           Cheat River         8         14         3.5         21         1.8         8-13         2.2         1.7           Youghtogheny River         7         10         8.9         14         1.0         10,11         1.8         2.9           West Newton, Pa         15         23         2.0         15         0.4         28-30         0.8         1.6	Hinton, W. Va	95	14	3.4	19,20	1.8	9-14, 29, 30	1.8	2.1	
Dayton, Ohio         69         18         2.4         14         1.2         30         1.7         1.2           Monongahela River.         181         18         1.5         17         -0.6         24-26         -0.4         2.1           Weston. W. Va         119         25         2.2         14         -0.3         9,10         0.5         2.5           Greenshoro, Pa         81         18         8.1         21         6.5         28         7.2         1.6           Lock No. 4, Pa         40         28         7.9         15         5.9         10,11         6.6         2.0           Chat River.         80         14         3.5         21         1.8         8-13         2.2         1.7           Youghlogheny River.         59         10         3.9         14         1.0         10,11         1.8         2.9           West Newton, Pa         15         23         2.0         15         0.4         28-30         0.8         1.6           Muskingune River.         15         23         2.0         15         0.4         28-30         0.8         1.6	Falmouth, Ky	30	25	4.5	29	1.0	18	1.9	3.5	
Weston, W. Va     161     18     1.5     17     -0.6     24-26     -0.4     2.1       Fairmont, W. Va     119     25     2.2     14     -0.3     9,10     0.5     2.5       Greensboro, Pa     81     18     8.1     21     -6.5     28     7.2     1.6       Lock No. 4, Pa     40     28     7.9     15     5.9     10,11     6.6     2.0       Cheat River     Rowlesburg, W. Va     36     14     3.5     21     1.8     8-13     2.2     1.7       Youghtogheny River     7     9     10     8.9     14     1.0     10,11     1.8     2.9       West Newton, Pa     15     23     2.0     15     0.4     28-30     0.8     1.6       Muskingune River	Dayton, Ohio	69	18	2.4	14	1.2	30	1.7	1.2	
Greenshoro, Pa	Weston, W. Va									
Creat River.         Rowlesburg, W. Va         36         14         3.5         21         1.8         8-13         2.2         1.7           Youghiogheny River.         59         10         3.9         14         1.0         10,11         1,8         2,9           West Newton, Pa         15         23         2.0         15         0.4         28-30         0.8         1.6           Muskingum River.         70         20         20         15         0.4         28-30         0.8         1.6	Greensboro, Pa	81	18	8.1	21		28	7.2		
Rowlesburg, W. Va     36     14     3.5     21     1.8     8-13     2.2     1.7       Youghtogheny River.     59     10     8.9     14     1.0     10.11     1.8     2.9       West Newton, Pa     15     23     2.0     15     0.4     28-90     0.8     1.6       Muskingune River	Lock No. 4, Pa	40	28							
Confluence, Pa	Rowlesburg, W. Va Youghiogheny River.	ĺ I		1	21	1.8	8–13	2.2	1.7	
	West Newton, Pa									
	Zanesville, Ohio	70	20	9.8	16	6.5	24-28	7,4	3.3	

Heights of rivers above zeros of gauges—Continued.							. Heights of rivers referred to zeros of gauges—Continued.										
Stations.	ance to outh of ver.	iger line 1 gauge.	Highest water.		Lowest water.		stage.	nthly ange.	Stations.	unce to uth of er.	iger line gauge.	Highest water.		Lowest water.		stage.	thly nge.
	Dista mo	Dang	Height	Date.	Height.	Date.	Mean	Mon		Distance mouth river.	1 8 - 1	Height.	Date.	Height.	Date.	Mean	Mon
Tennessee River. Knoxville, Tenn Kingston, Tenn	Miles. 614 584	Feet. 29 25	Feet.	21.22	Feet.	14-16	Feet.	Feet.	Alabama River.  Montgomery, Ala Selma, Ala	Miles. 265 212	Feet. 35 35	Feet. 1.5 1.4	24 27	Feet. -0.8 -1.3	13 12, 14, 15	Feet. 0.2 -0.2	Feet. 2.3 2.7
Chattanooga, Tenn Bridgeport, Ala Florence, Ala	430 390 220	33 24 16 21	5.6 4.6 3.8	21,22 23 28 25 25	1.6 0.6 0.5 1.4	15 12, 15, 16 14 16	2.9 1.6 1.4 2.7	4.0 4.0 3.3 2.9	Coosa River Rome, Ga	225 144	30 18	3.6 2.1	23 20	1.2 -0.1	12 16	1.8 0.5	2.4 2.2
Johnsonville, Tenn  Clinch River.  Speers Ferry, Va	94 156	20	4.8 5.9	19	0.3	\6, 7, 9, 10/ \7, 13, 16 \	1.1	5.6	Columbus, Miss Demopolis, Ala	285 155	33 35	1.7 1.8	17 20	-3.1 -1.5	13 14	-1.8 0.0	4.8 2.3
Clinton, Tenn  Wabash River.  Mount Carmel, Ill	46 50	25 15	11.5 15.0	21	3.4	15 30	5.2	8.1 12.0	Tuscaloosa, Ala	90 145	38 27	1.3 4.8	27 20	-0.7 0.8	13 12-14	1.0	2.0 4.0
Red River. Arthur City, Tex Fulton, Ark	688 565	27 28	12.5 18.5	16 18	5.6 9.0	5, 6, 13	8.9 12.3	6.9 9.5	Black River.   Kingstree, S. C   Lumber River.   Fairbluff, N. C	60	12	6.8 1.0	30 28	0.2	18 13-18	2.3 -0.1	6.6
Shreveport, La	449 139	29 33	14.1 14.1	1 3	9.1 8.4	15 18	11.5 11.3	5.0 5.7	Lynch Creek. Effingham, S.C Potomac River.	35	12	6.4	23	1.7	15,16	3.1	4.7
Melville, La Ouachita River.	100* 340	31 39	32.0 12.0	1-3 20	26.6	30 30	29.7	5.4 6.2	Harpers Ferry, W. Va  Roanoke River.  Clarksville, Va  Sacramento River,	170 155	16 12	2.9 3.6	1 19	0.3	29, 30 10-12	1.7	1.7 3.3
Camden, Ark	100	40	19.4	1	12.2	15	14.9	7.2	Red Bluff, Cal	241 70	23 25	1,0 13.3	1 4	0.1 9.0	26-30 30	0.4 10.9	0.9 4.3
Yazoo City, Miss	80 140	25 20	17.4	22	4.0	30 1-3	10.3	13.4	St. Stephens, S.C	50 37	12 15	6.6 2.2	24 20	-2.0 1.0	15, 16 11-13, 15	1.2	8.6
Flint River. Albany, Ga	80	20	3.6	30	0.5	7-10	1.5	3.1	Wateree River. Camden, S. C	45	24	10.5	18	1.4	13, 14	3.4	9.1
Fayetteville, N.C  Columbia River. Umatilla, Oreg	100 270	38 25	7.0	21, 22 17, 18	1.1	9, 12	2.8	5.9 2.6	Augusta, Ga	130	32	9.7	21	4.0	11,30	5.1	5.7
The Dalles, Oreg Willamette River.	166	40	36.9	20,21	32. 2	10	34.8	4.7 2.5	Wilkesbarre, Pa	178 70	14 17	3.0 4.3	12 1	0.0	19-22, 27-30 30	1.0 2.6	1.2 2,6
Albany, Oreg Portland, Oreg  Edisto River.	99 10	20 15	20.7	2, 3 19, 21, 22	2.0 18.5	27-30 9,10,30	3.0 19.6	2.5 2.2 2.6	Juniata River, Huntingdon, Pa W. Br. of Susquehanna,	80	24	4.5	1	2.9	30	3.4	1.2
Edisto, S. C  James River.  Lynchburg, Va	257	18	3.0	25-27 1, 20, 21	0.4	13-16		0.9	Williamsport, Pa Waccamaw River.	35	20	3.5	1	1.0	2.8	2.0	2.5
Richmond, Va		12	0.9	6	0.0	29,30	0.4	0.9	Conway, S.C	40	7	2.8	9	0.1	16	1.4	2.7

## THE WEATHER OF THE MONTH.

\*Distance to Gulf of Mexico.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

sented in the tables which form the closing part of this RE-| normal conditions. Pressure was almost normal in the ma-VIEW. Table I, in particular, contains numerous details that are important in the study of climatology. The numerical values in the tables have been generalized in a number of cases, the results appearing on Charts Nos. III to VIII, Oregon, and part of Washington. inclusive.

## PRESSURE AND WIND.

Normal conditions.—The geographic distribution of normal barometric readings at sea level and under local gravity for June is shown by Chart V of the Monthly Weather Re-VIEW for June, 1893.

Normal pressure in June is highest over the south Atlantic and north Pacific coasts and lowest over Arizona and the Plateau region. As compared with May, it is the same or slightly less in all districts, except the south Atlantic coast, where there is a slight increase, amounting to about 0.02 inch on the average.

The prevailing winds, except on the Pacific coast, are generally from a southerly quarter—southwesterly in New England and the lower Lake region, southerly in the Mississippi Valley, the south Atlantic and Gulf coasts, and southeasterly on the Plains. On the Pacific coast the general tendency is to blow from some westerly quarter.

The current month.—The distribution of monthly mean west and west.

The statistical aspects of the weather of the month are pre-pressure, as shown by Chart IV, is closely in accord with jority of districts, the greatest plus departures occurring in North Dakota and Manitoba and over a narrow strip of the Rocky Mountain region, extending from Denver to Helena. Pressure was below normal over Arizona, Nevada, California,

> The changes from May to June were rather large, there being an increase of from 0.05 to 0.08 inch over the territory bordering the Atlantic from Connecticut southward, and extending inland to the Ohio Valley and the lower Lakes. There was a corresponding decrease over the upper Missouri Valley and the Northwest, amounting to 0.12 inch at Williston and 0.06 inch at Denver. Pressure also fell 0.05 inch and over in California from Sacramento southward.

> The prevailing winds on the Atlantic coast were almost without exception from seaward or parallel with the coast line. Some distance inland they became southwesterly, shifting to westerly in the lower Lake region. On the upper Lakes the prevailing direction was in some cases from the northwest and in others from the east and southeast.

> In the Mississippi Valley and the Plains region the winds were generally southeasterly; in the upper Mississippi Valley from the north and northwest. The winds over the Rocky Mountain and Plateau regions were generally from a southerly quarter, and on the Pacific coast from the north-